

**PRESERVATION OF HISTORICAL RECORDS  
AT THE  
JET PROPULSION LABORATORY**

**PRESENTED BY  
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**TO THE  
SOCIETY OF CALIFORNIA ARCHIVISTS**

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## **AGENDA**

- **Information about JPL**
- **Earlier efforts to preserve JPL's historical records**
- **Establishment of the JPL Archives**
- **Other sources of historical information at JPL**
- **Opportunities for the JPL Archives**
- **Conclusion**

## **INFORMATION ABOUT JPL**

- **What is JPL—the Jet Propulsion Laboratory?**
  - **JPL is**
    - **an operating division of the California Institute of Technology (Caltech);**
    - **a federally funded research and development center (FFRDC) under contract with NASA—National Aeronautics and Space Administration;**
    - **supports NASA and Defense programs, and civil programs of national importance compatible with JPL capabilities;**
    - **is the lead U.S. center for robotic exploration of the solar system;**
    - **manages the Deep Space Network, which communicates with spacecraft and conducts scientific investigations from its complexes in the Mojave Desert, in Spain, and in Australia.**
  - **JPL is located at the foot of the San Gabriel Mountains, near Pasadena.**
  - **The Director of JPL is Dr. Ed Stone (since January 1991).**
- **Origins date to the 1930s, when Caltech professor Theodore von Karman conducted pioneering work in rocket propulsion.**
  - **Graduate students tested a primitive rocket engine in a dry riverbed area north of where the Rose Bowl is now located—first rocket firing took place there on October 31, 1936.**

- **U.S. ARMY ERA**
  - After successful rocket experiment, von Karman, who also served as a scientific adviser to the U.S. Army Air Corps, persuaded the Army to fund development of strap-on rockets—JATO, for “jet-assisted take-off”—to help overloaded Army airplanes to take off from short runways.
  - Up to 1958
    - Funded by Army Ordnance, JPL’s early efforts would eventually involve technologies beyond those of aerodynamics and propellant chemistry, technologies that would evolve into tools for space flight, secure communications, spacecraft navigation, and control and planetary exploration.
    - Work included:
      - Small unguided missiles, called the Private
      - Experimented with radio telemetry from missiles
      - Planned for ground radar and radio sets
      - Corporal—guided missile, with two-way radio control and radar and primitive computer at the ground station
      - Developed a supersonic wind tunnel and array of environmental test technologies
      - Developed new test techniques and a new discipline called system engineering
      - Developed the flight and ground systems
      - Flew first successful U.S. space mission—Explorer 1
        - Launch on January 31, 1958

- **NASA ERA, 1958 to Present**
  - **On December 3, 1958, two months after NASA was created by Congress, JPL was transferred from Army jurisdiction to that of NASA.**
  - **JPL since then has been involved with a series of robotic spacecraft to explore space.**
    - **These have included:**
      - **Ranger and Surveyor—to the moon**
      - **Mariner missions to Mercury, Venus, and Mars**
      - **Viking—to Mars**
      - **Voyager 1 and 2**
        - **Voyager 1 and 2—flew by Jupiter and Saturn**
        - **Voyager 2—flew by Uranus and Neptune**
      - **Magellan—to Venus**
      - **Galileo—Jupiter**
      - **Ulysses—to the Sun**
      - **Mars Observer—with which contact was lost as it neared Mars**
      - **Mars Global Surveyor—Mars**
      - **Mars Pathfinder—Mars**
      - **Mars Climate Orbiter—lost near Mars (atmosphere)**
      - **Mars Polar Lander—lost near/on Mars**
      - **Cassini—to Saturn**
      - **STARDUST—to collect dust and volatile materials from near the comet Wild-2**
      - **Deep Space 1—to test an ion engine and 11 other new Technologies**

## **EARLIER EFFORTS TO PRESERVE JPL'S HISTORICAL RECORDS**

- **The earliest effort came with the creation and maintenance of a Central File, which existed from 1944 to 1962.**
  - **These records were microfilmed in the mid-1970s and the originals presumably were destroyed, to conserve space.**
- **Engineering Document Services (EDS)—the Vellum File—predates the establishment of the JPL Archives, with its origins dating to the 1970's.**
  - **EDS maintains and distributes JPL internal and external documents and engineering drawings.**
  - **Its collection consists primarily of engineering drawings and JPL internal documents containing a D-number (an internal numbering system for tracking purposes) and project number such as program and project documents, as well as external documents such as publications, brochures, newsletters, and quarterly reports.**
  - **Hardcopy documents are microfilmed, with the hardcopy being retained for a period of approximately five years. The microfilm is retained permanently.**
  - **EDS is referred to at times as an archive of JPL materials, however, it is incomplete since it usually does not have complete sets of project files (correspondence, IOMs, etc.)**
- **History File/History Collection (Cargill Hall Collection)**
  - **This is an artificial collection of several thousand items, from single pages to multi-volume reports.**
  - **The materials were collected and organized by the first and only official JPL Historian—Cargill Hall, in the period of the late 1960s to the mid-1970s.**

- **Within this collection are records of Army Ordnance projects such as Corporal and Sergeant; NASA programs including Ranger, Surveyor, and Mariner; and other JPL research and development activities**
  - **The Collection consists primarily of photocopies of originals—gathered from numerous sources by the Historian and others at the Laboratory.**
- **When the JPL Historian's Office was disbanded in the mid-1970s, the collection was transferred to the JPL Library**
- **In late 1989, the History Collection was moved to the newly created JPL Archives, where it now serves as an essential core of early JPL historical information.**
- **Laboratory Records Center**
  - **This established in late 1960s to provide central storage for inactive records from projects and programs, individual employees, and administrative offices.**
  - **In a sense, it replaced the Central Files, but the files were no longer centralized as before.**
  - **Until the establishment of the JPL Archives, the managers of the Laboratory Records Center saved records they thought might have historical value.**
  - **Records were also sent to the Federal Records Center, first located at Bell and then relocated to Laguna Niguel.**
  - **The Records Center continues in operation today, operating under contract to a subcontractor.**

## **ESTABLISHMENT OF THE JPL ARCHIVES**

- The first known proposals to hire an Archivist for JPL were made beginning in the late 1970s and were revived in the late 1980s.
- During the period that Clayton Koppes was researching his history of JPL, titled, *JPL and the American Space Program: A History of the Jet Propulsion Laboratory* (published in 1982 by Yale University Press), Caltech history professor, Dr. Daniel Kevles, who served as the Principal Investigator for the history project, proposed that JPL hire a professional historian to act as an archivist. This action, according to Prof. Kevles, would ensure that a centralized system of document disposition would exist at JPL.
- Prof. Kevles submitted a proposal to the Laboratory Director, Dr. Bruce Murray in 1978, but the proposal was not accepted.
- In the JPL history published in 1982, Clayton Koppes provided insight into the difficulties of researching the history of JPL:
- “After 1962 no central file exists; the records consist of files transferred, and in most cases still controlled, by the originating office or person. Finding aids are minimal and in some cases nonexistent. By comparison with the usual archival research, the historian must shovel through huge quantities of material before locating key items to sift.” (*JPL and the American Space Program: A History of the Jet Propulsion Laboratory*, “A Note on Sources,” p. 287.)
- In 1987, Dr. David B. Gracy, at the time the Texas State Archivist and currently Professor in the Graduate School of Library and Information Sciences at the University of Texas at Austin, was hired by JPL as a consultant on a proposed archives.
  - Dr. Gracy, in his report to JPL in 1987, stated that JPL records were too important in providing information about the Laboratory’s operations and achievements to be left



**unattended, and that it was important for the Laboratory to hire an archivist and establish an archives.**

- **Dr. Gracy's proposal received a positive response, when in July 1988 JPL approved a commitment for an archivist.**
- **I was hired as JPL's first professional Archivist in early 1989, and was able to hire another Archivist shortly afterward.**
  - **We began our work to establish the JPL Archives immediately.**
- **The JPL Archives was set up off-site in Pasadena due to the lack of available space at the Laboratory.**
- **During the period of April 1989 – Sept. 1998, the JPL Archives was operated by JPL. Beginning in September 1998, the Archives has been operated under contract by Sherikon Space Systems, Inc.**
- **My current responsibilities include being the JPL Chief Archivist and Technical Manager of the JPL Records Management/Archives Services Contract, which includes the JPL Archives.**
  - **The Mission of the JPL Archives is to document the history of the Laboratory's flight projects, research and development activities, and administrative operations.**
  - **The Archives is open to JPL and JPL contractor employees, NASA and NASA Contractor employees, and the public.**
  - **Web site: <http://beacon-archives.jpl.nasa.gov>**
- **I am also the point of contact for the NASA History Office at NASA Headquarters.**

- **The JPL Archives is the Institutional Archives for the Laboratory.**
  - **As we say, “The mission of the JPL Archives is to document the history of the Laboratory’s flight projects, research and development activities, and administrative operations.”**
  - **Holdings of the Archives include:**
    - **The History Collection, which was mentioned earlier;**
    - **Records for such projects as the Earth Observing System, Galileo, Magellan, Mariner, Mars Observer, Viking, and Voyager;**
    - **Audiovisual materials, including photographs, and negatives, motion picture film, video tape, and CD-ROMs;**
    - **Microfilm Collection , which contains administrative reports, as well as information on both Army Ordnance and NASA projects and other programs at JPL; and**
    - **Lastly, the Oral History Collection provides the unique personal narrative experiences of JPL employees**
  - **Bibliographic information about these and other processed collections are found in BEACON-Archives, which is the searchable online catalog. This Web-based catalog enables researchers to find a collection or document description using title, author, document number, subject terms, or any words and phrases appearing in the catalog entry.**
  - **JPL Archivists provide consultant services to the Laboratory’s projects, programs, line organizations, and individual employees on such matters as records appraisal, uses of digital imaging, retention of electronic records, etc.**
  - **A primary responsibility of the JPL Archives is to provide in-depth historical research assistance. This is done within the requirements imposed by Caltech’s Prime Contract with NASA, as well as Federal and international laws.**

- **Researchers include JPL and JPL contractor employees, Caltech, NASA and NASA contractor employees, and the public.**
- **While the JPL Archives is open to use by the public, access to and use of the records themselves is controlled by JPL Policy, specifically titled, “Releasing Information Outside of JPL.”**
  - **According to this policy, “Any information intended for release outside of JPL must be approved prior to release by the cognizant manager and also by [JPL’s] Document Review Services.” This requirement applies to materials preserved in the Archives, such as scientific or technical information, technical presentations, and policy statements. (from “Releasing Information Outside of JPL, Rev. 1,” June 5, 1998, found in the JPL DMIE Information System)**
  - **Public researchers are informed of this requirement as soon as they request to use the records themselves. Although it does provide an obstacle to efficient research, few researchers have been denied access to specific records.**
- **Current topics being researched include the Voyager Project and the Galileo Project, both of which are being researched by historians under contract with the NASA History Office.**

## **OTHER SOURCES OF HISTORICAL INFORMATION**

- **Although the JPL Archives is the Institutional Archives for the Laboratory, there other sources of historical information, some of it accessible directly by the public, while others are accessible only by JPL employees.**
- **These other sources of historical information include, but are not limited to, the following:**
  - **The previously mentioned Engineering Document Services, which holds microfilm and hard copies of internal documents, engineering drawings, specifications, etc. It is not open to the public.**
  - **Regional Planetary Image Facility (RPIF)—open to the public—which contains images, topographic maps, and geologic maps of planets and their satellites taken both from Earth and in space and mission documentation.**
  - **Planetary Data System, which archives and distributes digital data from past and present NASA planetary missions, astronomical observations, and laboratory measurements to the public.**
  - **The JPL Media Relations Office public Web site, which contains a JPL Picture Archive of missions, facilities, Directors, and technology-related images; an archive of News Releases (from 1996 to present); and information about Current, Future, Proposed, and Past missions; and back issues of the *Universe*, the Laboratory's house organ.**
  - **The JPL Photolab, which is for internal access only, contains an Archival Film Vault (permanent archival storage of still photographic negative and transparencies)**
    - **It also displays JPL Historical Photos on its internal Web site, some of which the Archives posted earlier.**

- **DMIE Information System (Define and Maintain the Institutional Environment<sup>0</sup>), which consists of an electronic database serving as a repository for institutional documents, including policies, procedures, charters and role statements, position descriptions, and manuals.**
  - **The System, which is for internal use only, contains both the current official documents, as well as the Archive documents.**
  - **Such documents are no longer distributed on paper.**
- **Accepting the fact that these other repositories do exist, we offer our expertise in ensuring that the materials they have are handled properly. Over time, as in the case of the Photolab and Engineering Document Services, materials are eventually transferred to the Archives.**

## **OPPORTUNITIES FOR THE JPL ARCHIVES**

- **But there are also activities, tasks, initiatives, and NASA-imposed requirements that can benefit the JPL Archives in its role as the Institutional Archives. For example:**
  - **Knowledge Management (KM), which at JPL is defined as “the process of making relevant information available quickly and easily for people to use productively. Information management is the process that focuses on the acquisition, arrangement, storage, retrieval, and use of information to produce knowledge.” (from *A Knowledge Management Architecture for JPL*, prepared by the Knowledge Management Study Team, January 15, 1999, JPL Document D-16577, p. v)**
  - **The JPL Archives is definitely in the information management business because our business is the acquisition, arrangement, storage, retrieval, and use of information to produce knowledge, as the definition states so clearly.**

- One of the initiatives included in the JPL KM activity is the creation of a JPL Electronic Archives.
  - The goal in establishing this electronic archives is to store all historical electronic records for retrieval and reuse by Laboratory personnel whenever they want and need it. Since the JPL Archives does not have this capability today, the success of this initiative will help to meet a need expressed by JPL employees.
  - Needless to say, addressing the issues of ever-changing technology, its preservation, and the retrievability of the information will be key to ensuring the ongoing viability of this archives. JPL Archivists are working with KM to address these issues.
- ISO 9001, which is a set of requirements in the International Organization for Standardization family of standards. JPL is required by the Caltech contract with NASA to be ISO registered, and JPL passing its audit in April 1999. In fact, all of NASA is now ISO registered.
  - ISO 9001 specifically applies to organizations doing design development, production, testing, and servicing of a product. (from the *Guide to ISO at JPL* Web site)
  - One of its elements is the Control of Quality Records, which requires that “quality records be maintained to demonstrate conformance to specified requirements and the effective operation of the quality system.” (from David Hoyle, *ISO 9000 Quality Systems Handbook*, Oxford: Butterworth-Heinemann Ltd., pp. 440)
  - Included in the requirements for quality records are that the identification, collection, indexing, access, filing, storage, maintenance, retention, and disposition of the records be described, documented, and carried out.
  - As a result of the ISO 9001 registration requirement, employees have become more aware of the records under their control, and are more likely to be amenable to sending inactive records to off-site storage. This in turn will benefit the JPL Archives, as

during this process records which are identified as historically valuable can be prepared for their eventual transfer to the Archives.

- NPG (NASA Procedures and Guidelines) 7120.5A, which is titled *NASA Program and Project Management Processes and Requirements*.
  - The NPG provides the basic processes and requirements for the life cycle of all programs and projects, in particular for those programs and projects that provide space and aeronautics, flight and ground systems, technologies, and operations. (from *NASA Program and Project Management Processes and Requirements*, NPG 7120.5A, April 3, 1998, p. 7)
  - In the area of historical information pertaining to NASA projects and programs, the NPG has a requirement called “Capture Process Knowledge,” which requires the collection and evaluation of process performance and the identification of process lessons learned. This requirement should make it easier to gather historical information from project and program perspectives for the JPL Archives, and should aid researchers in learning more about the successes and failures within each project and program.

## **CLOSING**

- **JPL has a rich history from its early days of doing work for the U. S. Army to today as NASA's lead Center for robotic exploration of the solar system. It is a history filled with both successes and failures.**
- **Recognizing that it needed to do something about preserving the historical evidence of its work, the Laboratory authorized eleven years ago the establishment of a formal JPL Archives and the employment of professional Archivists. Since that time, major strides have been made to ensure that the Laboratory's historical records are properly maintained and made available to researchers.**
- **But, as I have noted, there is competition from other sources, such as the DMIE Information System and Media Relations Office. And, while it has to be acknowledged that these other sources will continue to exist, and perhaps even expand, it is important that the JPL Archives and Archivists are involved to ensure the long-term preservation of and accessibility to these records.**
- **And, yet, while there is competition, there are also opportunities to expand the role and influence of the JPL Archives. Knowledge Management, ISO 9001, and NASA's NPG 7120.5A provide these opportunities.**
- **Of course, there is still much to be done, at JPL and the other NASA Centers. But, that is what makes our work interesting, challenging, and, yes, fun.**